San Mateo County Energy Snapshot

introductory information for the Utilities Working Group

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RecycleWorks
GREEN BUILDING
A PROGRAM OF SAN MATEO COUNTY

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The Utilities Working Group is a subcommittee of CMAQ and
staffed and supported by CCAG and
the County of San Mateo Public Works Department

Introduction

This snapshot of the current usage and trends within San Mateo County is intended to inform the newly formed Utilities Working Group (UWG) and to help frame some of the initial questions in developing an energy strategy and to form a basis for common understanding of the issues. As the UWG confers and asks questions, deeper data or analysis can be added to this snapshot view.

CO_2 Emissions – from our built environment

This snapshot starts with CO_2 because CO_2 emissions represent the overall impact of our energy use on the global issue of climate change. On a national basis, electricity and natural gas usage produce half of the anthropogenic sources of CO_2 emissions. In San Mateo County, it is somewhat less due to our relatively clean electricity mix.

Nationally, CO_2 emissions from buildings – residential, commercial and industrial – rose by 1.7% from 2001 to 2004; in San Mateo County, the emissions increased by 14.9% in the same time period. This is caused partially by the changing mix of where our electricity comes from. When most of our electricity comes from nuclear, large hydro or renewable energy, a small amount of CO_2 is emitted. But if some electricity is generated in coal burning plants or older natural gas burning plants such as Hunters Point in San Francisco, the factor to convert kWhs to CO_2 tons increases. The energy mix here on the Peninsula is relatively clean – and the production of our electricity only produces half as much CO_2 as the national average. However, due to increased usage, the mix has become more dependent on less clean sources of electricity and therefore the CO_2 increases. (For conversion factors, please see appendix)

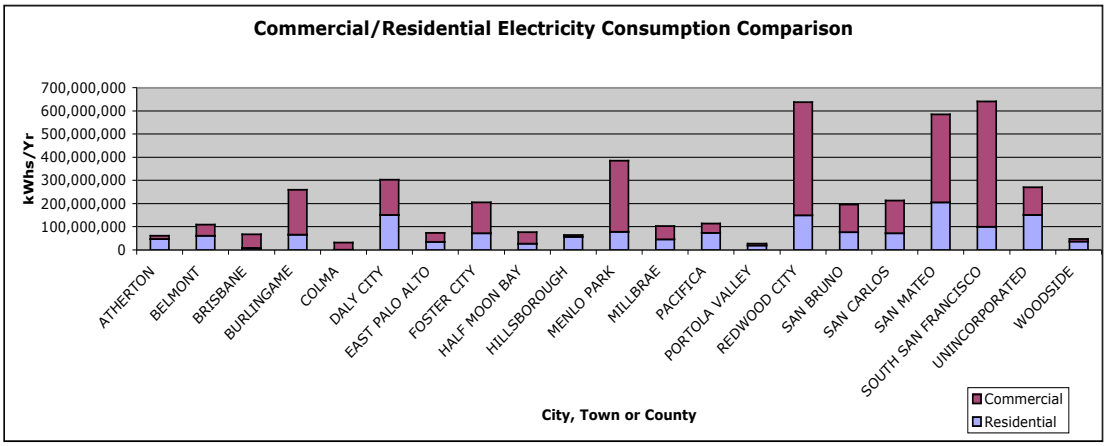
Global Greenhouse Emissions: Calculating the CO_2 generated by the County of San Mateo built environment

YEAR	Electricity (kWhs)	CO_2	Natural Gas	CO_2	TOTAL CO_2 tons
2001	4,372,586,265	1,033,683.77	252,727,121	1,470,871.84	2,504,556
2002	4,212,327,604	995,798.46	254,129,664	1,479,034.64	2,474,833
2003	4,435,886,126	1,241,826.32	249,267,282	1,450,735.58	2,692,562
2004	4,590,780,856	1,426,585.15	249,343,012	1,451,176.33	2,877,761
2005	4,480,713,617	1,392,381.76	239,246,323	1,392,413.60	2,784,795
Percentage of increase 2001 to 2005	2.47%	34.70%	-5.33%	-5.33%	11.19%

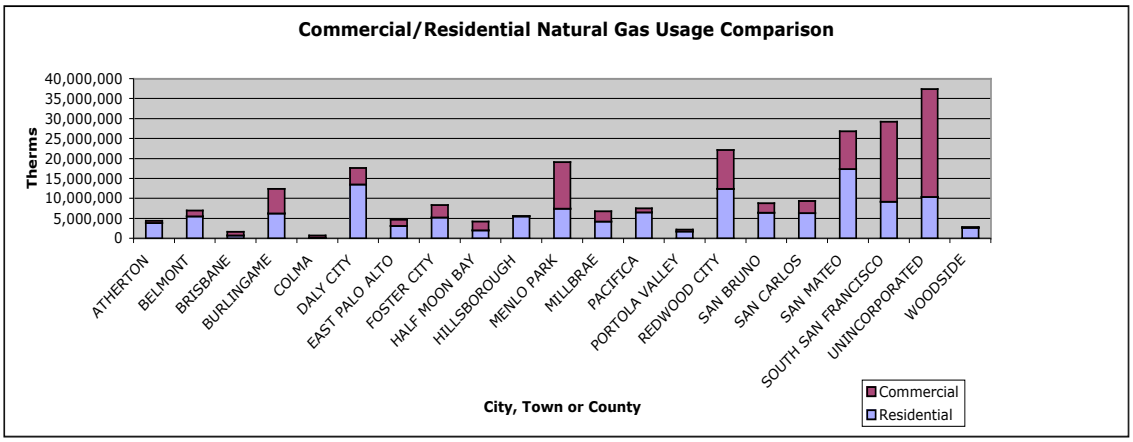
(see paragraph above for explanation of why CO2 increases faster than electricity usage.)

Commercial/Residential Ratios

Countywide residential energy usage makes up 35% of the electricity and 55% of the natural gas consumption. As we would expect, this varies widely by city or town. The following chart compares electrical usage by city and divides the usage in each city into commercial and residential use. The only data that is not included in the calculations are accounts that are owned and paid for by the City and County of San Francisco, such as the San Francisco Airport, the San Bruno Jail, pumps for their water system, etc. Most, if not all, of the San Francisco facilities are located in the unincorporated county.

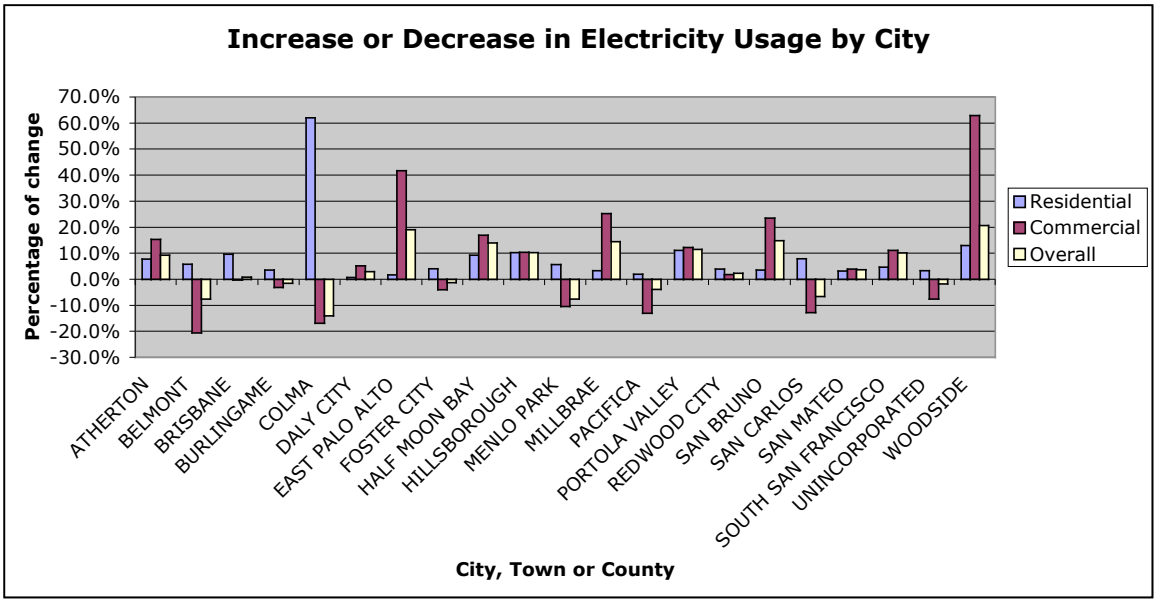


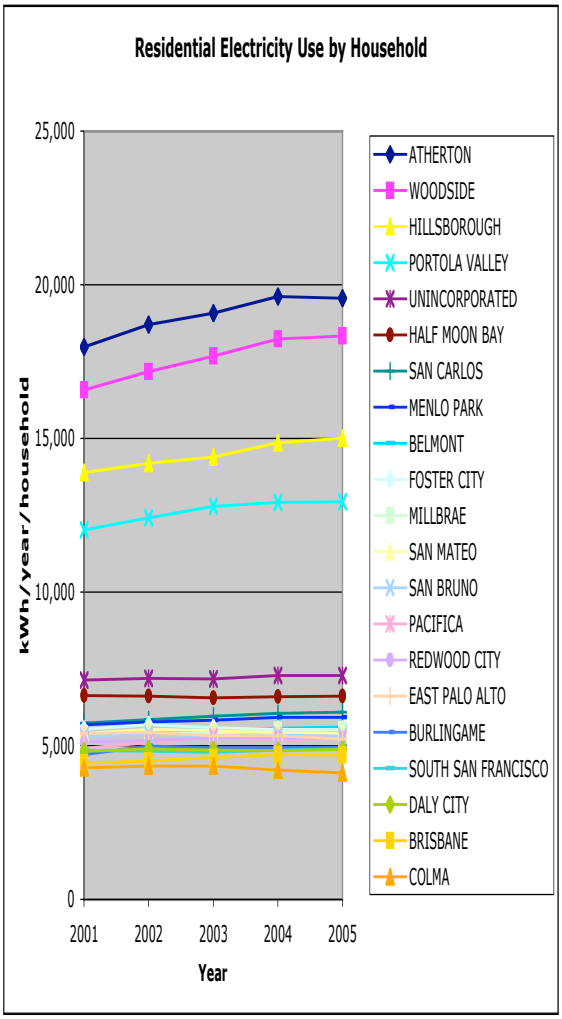
The following chart illustrates the relationships between commercial vs. residential by jurisdiction. In this case, the San Francisco owned facilities are included in the data set.

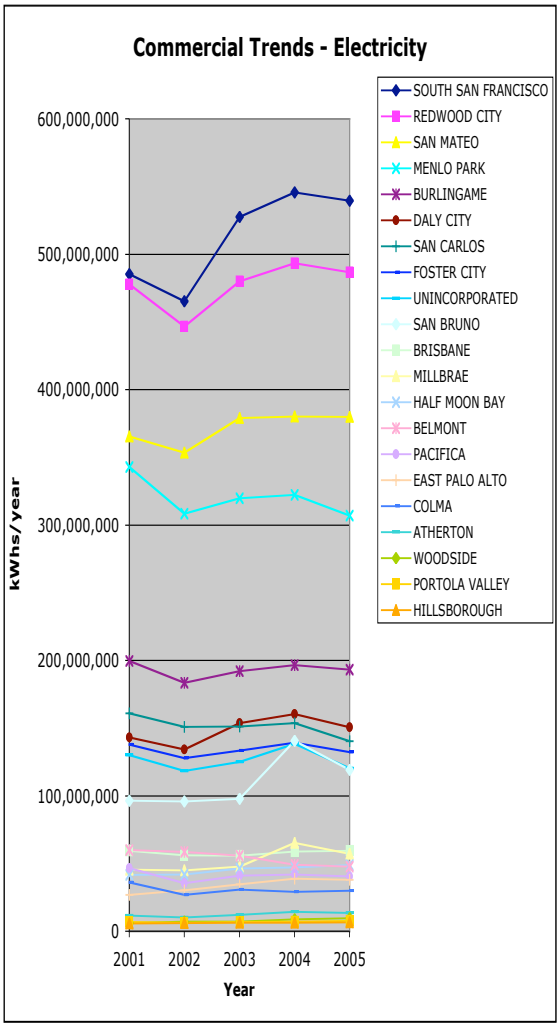


Electricity Consumption

Electricity consumption on a countywide basis has increased by 2.5%, (to 4,480,713,617 kWhs in 2005) with the most dramatic changes by percentage happening in East Palo Alto, Woodside, Millbrae and San Bruno (commercial) and in Colma and Woodside (residential).


Increase or Decrease in Electricity Usage by City
Percentage of change
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
-10.0%
-20.0%
-30.0%
ATHERTON
BELMONT
BRISBANE
BURLINGAME
COLMA
DALY CITY
EAST PALO ALTO
FOSTER CITY
HALF MOON BAY
HILLSBOROUGH
MENLO PARK
MILLBRAE
PACIFICA
PORTOLA VALLEY
REDWOOD CITY
SAN BRUNO
SAN CARLOS
SAN MATEO
SOUTH SAN FRANCISCO
UNINCORPORATED
WOODSIDE
Residential
Commercial
Overall
City, Town or County


Residential Electricity Use by Household
kWh/year/household
25,000
20,000
15,000
10,000
5,000
0
2001
2002
2003
2004
2005
Year
ATHERTON
WOODSIDE
HILLSBOROUGH
PORTOLA VALLEY
UNINCORPORATED
HALF MOON BAY
SAN CARLOS
MENLO PARK
BELMONT
FOSTER CITY
MILLBRAE
SAN MATEO
SAN BRUNO
PACIFICA
REDWOOD CITY
EAST PALO ALTO
BURLINGAME
SOUTH SAN FRANCISCO
DALY CITY
BRISBANE
COLMA

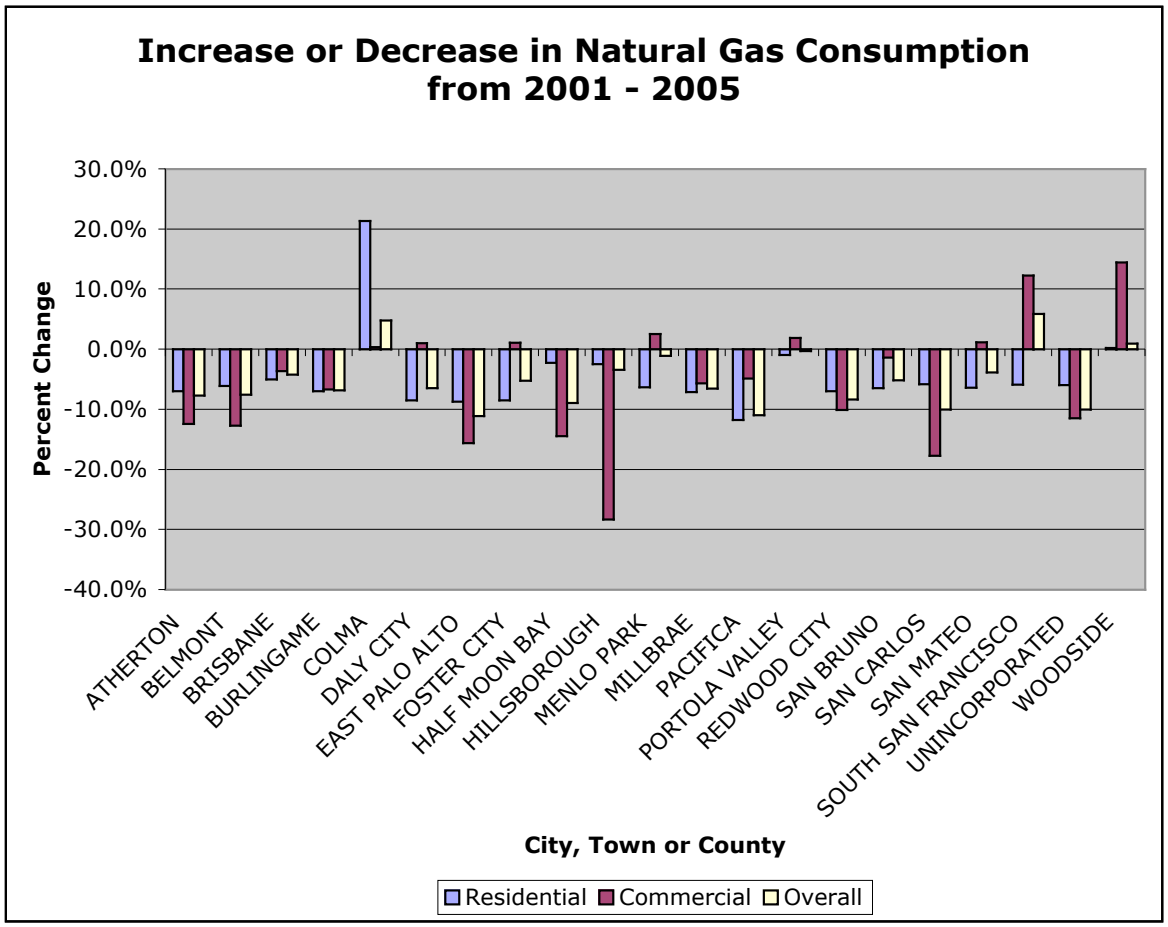

Commercial Trends - Electricity
kWhs/year
600,000,000
500,000,000
400,000,000
300,000,000
200,000,000
100,000,000
0
2001
2002
2003
2004
2005
Year
SOUTH SAN FRANCISCO
REDWOOD CITY
SAN MATEO
MENLO PARK
BURLINGAME
DALY CITY
SAN CARLOS
FOSTER CITY
UNINCORPORATED
SAN BRUNO
BRISBANE
MILLBRAE
HALF MOON BAY
BELMONT
PACIFICA
EAST PALO ALTO
COLMA
ATHERTON
WOODSIDE
PORTOLA VALLEY
HILLSBOROUGH

The amount of electricity used per household varies widely and appears to correlate to the size of the homes and the wealth of the residents. Atherton, Hillsborough, Portola Valley and Woodside account for 10.6% of the residential electrical use, but have only 4.4% of the population in the county.

The City and County of San Francisco uses almost 20% more electricity than all of San Mateo County according to 2001 data. Of that, 27% is residential use (compared to our 35% residential use). San Francisco shares the transmission lines that go through San Mateo County. Their electricity is handled by two agencies: the San Francisco Public Utilities Commission (PUC), which handles municipal accounts, museums and schools, and PG&E, which handles the rest.

Natural Gas Usage

Consumption of natural gas has gone down by 6.6% countywide. With only a few exceptions, the trends indicate that consumption both residentially and commercially is decreasing. Only three jurisdictions are using more natural gas now then in 2001: South San Francisco (5.9%), Colma (4.8%) and Woodside (1%).

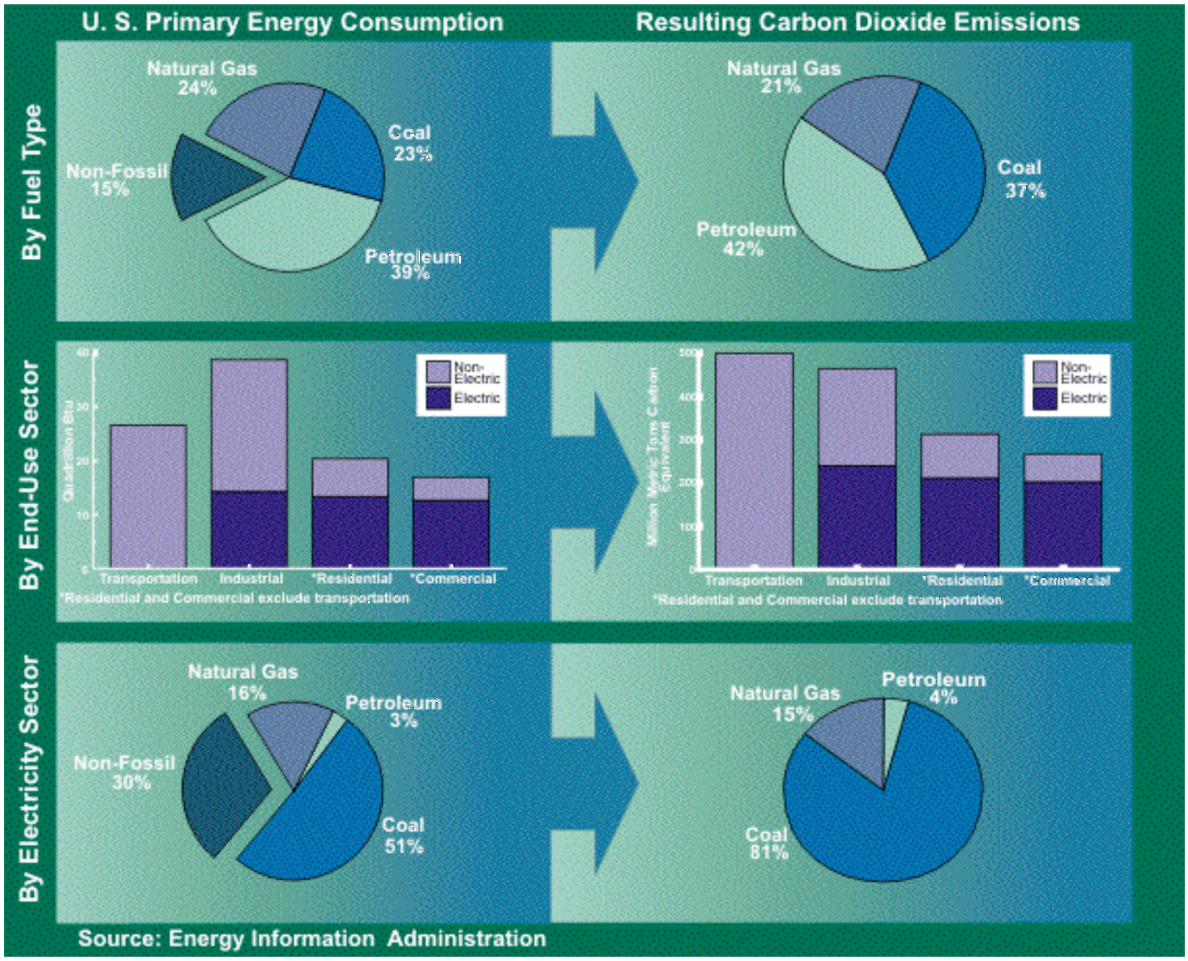


Atherton, Hillsborough, Portola Valley and Woodside consume the most natural gas per capita, consuming 10.4% of the overall residential usage in the County.

Summary

This Snapshot gives a glimpse of how energy is used in the county and what the current trends are. The bigger picture will include peak demand, capacity, and source of energy. As questions are asked and topics are raised, more information will be provided to supplement this initial report.

Appendix 1:
National Chart on Energy Consumption and CO_2 Emissions



Appendix 2:

Conversion Factors for CO_2:

Electricity in San Mateo County (the Northern CA Mix):

	Conversion Factors for kWhs to CO_2 lbs
1990	0.536000667
1991	0.522001333
1992	0.554000333
1993	0.412001333
1994	0.595998333
1995	0.331998333
1996	0.303999667
1997	0.356000333
1998	0.368001333
1999	0.512233333
2000	0.472802
2001	0.472802
2002	0.472802
2003	0.5599
2004	0.6215
2005	0.6215*

* conversion factor from 2004

Conversion Factor for Natural Gas therms to CO_2 lbs: therms x11.64 = lbs CO_2